



LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA13 | Calvert, Steeple Claydon, Twyford and Chetwode
Construction assessment (SV-003-013)
Sound, noise and vibration

November 2013

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Department for Transport

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1 Introduction

- 1.1.1 The sound, noise and vibration appendices comprise four sections. The first of these is an introduction to the relevant policy and methodology (Volume 5: Appendix SV-001-000). This relates to the sound, noise and vibration assessment for all community forum areas (CFA).
- 1.1.2 For the Calvert, Steeple Claydon, Twyford and Chetwode community forum area (CFA13), the other three sections are as follows:
- baseline sound, noise and vibration (Volume 5: Appendix SV-002-013);
 - construction sound, noise and vibration (Volume 5: Appendix SV-003-013) (this appendix); and
 - operational sound, noise and vibration (Volume 5: Appendix SV-004-013).
- 1.1.3 The outcomes of the assessment are summarised in Volume 2: CFA Report 13, Calvert, Steeple Claydon, Twyford and Chetwode (CFA Report 13), Section 11.
- 1.1.4 Maps referred to throughout the sound, noise and vibration appendices are contained in the Volume 5 Map Book: Sound, noise and vibration.
- 1.1.5 This appendix presents the likely noise and vibration impacts, effects and significant effects arising from the construction of the Proposed Scheme for the Calvert, Steeple Claydon, Twyford and Chetwode area on:
- people, primarily where they live ('residential receptors') in terms of:
 - individual dwellings;
 - on a wider community basis, including any shared community open areas; and
 - community facilities such as schools, hospitals, places of worship, and also commercial properties such as offices and hotels, collectively described as 'non-residential receptors' and 'quiet areas'.
- 1.1.6 The assessment of likely impacts, effects and significant effects from construction noise and vibration on agricultural, community, ecological or heritage receptors and the assessment of tranquillity are presented in the following documents within Volume 5:
- | | |
|-----------------------------------|---------------------|
| • Agriculture, forestry and soils | Appendix AG-001-013 |
| • Community | Appendix CM-001-013 |
| • Ecology | Appendix EC-005-013 |
| • Heritage | Appendix CH-003-013 |
| • Landscape and Visual | Appendix LV-001-013 |

1.2 Evaluation of impacts and effects

- 1.2.1 This appendix provides a quantitative assessment of construction noise and vibration impacts/effects and a qualitative assessment of likely significant effects, based on the impacts/effects identified and other local context information consistent with the scope and methodology defined for the Proposed Scheme.
- 1.2.2 Indirect effects arising from temporary changes in traffic patterns on the existing road network as a consequence of constructing the Proposed Scheme are also reported in this appendix, where they will occur within the study area (as defined in Volume 5: Appendix SV-001-000).
- 1.2.3 In undertaking the assessment of sound and vibration, consistent with Environmental Impact Assessment (EIA) Regulations and emerging National Planning Practice Guidance¹ a differentiation between impacts effects, adverse effects and significant effects is made. Further information is provided in Volume 5: Appendix SV-001-000.
- 1.2.4 The assessment of impacts and effects has been undertaken at assessment locations that are representative of a number of dwellings or other sensitive receptors. The assessment locations employed in this assessment are presented in the SV-03 Map Series (Volume 5, Sound, Noise and Vibration Map Book).

¹ Information is provided in the Department for Communities and Local Government's emerging National Planning Practice Guidance – Noise <http://planningguidance.planningportal.gov.uk>, (refer to the noise exposure hierarchy), as available on 14th October 2013.

2 Scope, assumptions and limitations

2.1 Regional and local policy guidance

2.1.1 The policy framework for sound, noise and vibration is set out in Volume 1 and in Volume 5: Appendix SV-001-000. As part of the engagement with local authorities through the Planning Forum Sub Group - Acoustics, information regarding any specific local planning guidance in respect of noise and vibration has been requested. Whilst no information has been received for this study area via the Planning Forum Sub Group - Acoustics, the following local policy guidance on noise and vibration has been identified:

- The Aylesbury Vale District Local Plan - Jan 2004; and
- Cherwell Local Plan - 1996.

2.1.2 This guidance has been considered as part of formulating the detailed application of the impact and significance criteria set out in Volume 5: Appendix SV-001-000.

2.2 Engagement

2.2.1 Details of engagement on a route-wide basis with the local and county authorities' Environmental Health Practitioners via the Planning Forum Sub Group - Acoustics, is set out in Volume 1.

2.2.2 Engagement with communities has been via the Community Forums, as set out in Volume 1. In respect of sound, noise and vibration the following discussions have taken place:

- general discussions in respect of local issues, including possible ways to avoid and mitigate the potential impacts of noise or vibration;
- September / October 2012: a specific presentation about sound, noise and vibration with discussion afterwards with one of the project team specialists;
- November / December 2012: specific request for the Community Forum regarding baseline sound monitoring locations;
- January / February 2013: feedback to the Community Forum on any proposed baseline monitoring locations; and
- verbal / written responses to questions and sound, noise and vibration.

2.3 Methodology

2.3.1 The methodology used for the assessment of airborne sound, ground-borne sound and vibration impacts and the determination of significant effects is defined in the Scope and Methodology Report (SMR) (Volume 5: Appendix CT-001-000/1). Further clarification regarding specific areas is presented in the SMR addendum (Volume 5: Appendix CT-001-000/2). Further information is contained in Volume 5: Appendix SV-001-000.

2.4 Assumptions

- 2.4.1 Route-wide assumptions are outlined in Volume 1 and are further detailed in Volume 5: Appendix SV-001-000. Local assumptions that apply to the assessment of construction sound noise and vibration within this area are set out in Volume 2: CFA Report 13.

2.5 Limitations

- 2.5.1 The route-wide limitations and the approach adopted to assure that they will not impact the robust assessment of sound, noise and vibration are presented in Volume 5: Appendix SV-001-000. No specific additional limitations are identified for this study area.

3 Environmental baseline

3.1 Existing baseline

- 3.1.1 Baseline sound level data has been collected at locations representative of the airborne sound-sensitive receptors. The existing and future baseline airborne sound levels derived from these measurements are given in Volume 5: Appendix SV-002-013. Details of the baseline data collection and the methodology are given in Volume 5: Appendix SV-001-000 and specifically for this study area in Volume 5: Appendix SV-002-013.

3.2 Future baseline

- 3.2.1 The assessment of noise from construction activities assumes a baseline year of 2017 which represents the period immediately prior to the start of the construction period. As a reasonable worst case, it has been assumed that no change in baseline sound levels will occur between the existing baseline (2012/13) and the future baseline year of 2017. The assessment of noise from construction traffic assumes a baseline year of 2021, representative of the middle of the construction period when the construction traffic flows are expected to be at their peak. Further information can be found in the Traffic and Transport assessment (Volume 5: Appendix TR-001-000).

4 Effects arising during construction

4.1 Introduction

4.1.1 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts and effects are presented. This is followed by the identification of significant effects and the evidence used to support these conclusions.

4.1.2 The structure of this assessment report is as follows:

- Avoidance and mitigation measures
- Quantitative identification of impact and effects
 - Ground-borne sound and vibration
 - residential
 - non-residential
 - Airborne sound
 - residential
 - non-residential
- Assessment of impacts and effects
 - residential receptors: direct effects – dwellings
 - residential receptors: direct effects – communities
 - residential receptors: indirect effects
 - non-residential receptors: direct effects
 - non-residential receptors: indirect effects
 - cumulative effects from the Proposed Scheme and other committed development

4.2 Avoidance and mitigation measures

4.2.1 These measures are set out in Volume 2: CFA Report 13.

4.3 Quantitative identification of impacts and effects

Ground-borne sound and vibration

4.3.1 Assessment locations defined for the quantitative assessment of impacts are shown in the SV-03 Map Series (Volume 5, Sound, Noise and Vibration Map Book).

4.3.2 For each assessment location, the assessment results for non-residential receptors are presented in Table 1. No residential receptors have been identified in this area within the screening distances (detailed in the SMR) from works which are a potentially significant source of vibration. Explanation of the information in Table 1 is provided in Volume 5: Appendix SV-001-000, with the following additional notes:

 Where the significant effect column is highlighted in pink, then a significant effect is identified at the referenced community, or individual receptor.

- * Significant effect – the quantitative impact methodology has identified either:
 - 1) no impact at this receptor but further information (see assessment) has identified that a significant effect is nonetheless likely; or
 - 2) an impact at this receptor which, based upon further qualitative receptor information, (see assessment text) does not give rise to a significant effect.
- ~ Significant effect – impacted dwellings which are either spatially remote from larger defined residential areas, or a small number of dwellings whose impact is not considered to represent the larger defined residential area, and as such are not considered to be part of a community significant effect.
- A Type of effect – adverse effect
- S Type of effect – significant adverse effect
- NA Type of effect – not generally an adverse effect
- B Type of effect – for non-residential receptors further detail about the type of effect is set out in the text of Volume 5: Appendix SV-001-000
- R Type of receptor – residential
- V₁ Type of receptor:
 - (V₁) vibration sensitive research and manufacturing, hospital, and university equipment;
 - (V₂) hotels, hospital wards and education dormitories;
 - (V₃) offices, schools and places of worship; or
 - (V₄) workshops.
- T Receptor design – typical
- S Receptor design – special

Table 1: Assessment of construction induced ground-borne vibration at non-residential receptors

Assessment location		Impact criteria				Significance criteria								Significant effect	
ID	Area represented	Peak particle velocity (PPV) [mm/s] on foundation	Typical/highest monthly indoor vibration dose value (VDV) [m/s ^{1.75}]		Construction activity resulting in highest forecast vibration levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [m]	Mitigation effect	
			Day (0700-2300)	Night (2300-0700)											
274142	Chetwode, Buckingham	1.98	0.65/0.65	-	Chetwode cutting - rail track formation / sub-ballast - medium roller	A	3	R	T	-	-	0.95	-	-	
274609	Chetwode, Buckingham	0.19	0.1/0.1	-	Chetwode cutting - rail track formation / sub-ballast - medium roller	NA	8	R	T	-	-	0.95	-	-	
275187	Chetwode, Buckingham	0.18	0.1/0.1	-	Chetwode cutting - rail track formation / sub-ballast - medium roller	NA	1	R	T	-	-	0.95	-	-	
275251	Chetwode, Buckingham	0.73	0.29/0.29	-	Chetwode cutting - rail track formation / sub-ballast - medium roller	A	1	R	T	-	-	0.95	-	-	
289621	West Street, Steeple Claydon	1.22	0.44/0.44	-	Calvert infrastructure maintenance depot and access road - earthworks for temporary railhead and depot - medium roller	A	1	R	T	-	-	5	-	-	
700424	Queen Catherine Road, Steeple Claydon	0.14	0.08/0.08	-	calvert infrastructure maintenance depot and access road - earthworks for temporary railhead and depot - medium roller	NA	3	R	T	-	-	5	-	-	

Assessment location		Impact criteria				Significance criteria								Significant effect	
ID	Area represented	Peak particle velocity (PPV) [mm/s] on foundation	Typical/highest monthly indoor vibration dose value (VDV) [m/s ^{1.75}]		Construction activity resulting in highest forecast vibration levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [m]	Mitigation effect	
			Day (0700-2300)	Night (2300-0700)		A	2	R	T	-	-	1.75	-	-	
711004	Committed Development C252-AV37	1.98	0.65/0.65	-	Chetwode cutting - rail track formation / sub-ballast - medium roller										

Airborne sound: direct impacts and effects

- 4.3.3 Activities associated with the construction phases of the Proposed Scheme will generate airborne noise. The assessment of the likely impacts and significant effects as a result of the construction noise has considered the effects on:
- residential receptors, both as individual dwellings and communities; and
 - non-residential receptors, including quiet areas.
- 4.3.4 For each type of receptor, subject to the screening distances identified, and based upon supplied plant information from engineers, the typical and highest monthly $L_{pAeq,T}$ noise levels from construction activities have been calculated at the façade of all assessment locations, which are representative of a number of receptors in the study area.
- 4.3.5 The assessment results, impact criteria and significance criteria for the assessment of the scheme at residential and non-residential receptors are presented in Table 2 and Table 3 respectively
- 4.3.6 The construction activity resulting in highest forecast noise levels is reported in Table 2 and Table 3 for each assessment location and time period, where the highest forecast noise level from any individual construction activity is above $L_{pAeq,T}$ 40dB during the daytime and evening periods and $L_{pAeq,T}$ 35dB during the night-time. Where the highest forecast noise level from any individual construction activity is less than $L_{pAeq,T}$ 40dB during the daytime and evening or $L_{pAeq,T}$ 35dB during the night-time no activities have been reported.
- 4.3.7 Explanation of the information within Table 2 and Table 3 is provided in Volume 5: Appendix SV-001-000, with the following additional notes:

	Where the significant effect column is highlighted in pink, then a significant effect is identified at the referenced community, or individual non-residential receptor
*	Significant effect – the quantitative impact methodology has identified either: <ol style="list-style-type: none">1) no impact at this receptor but further information (see assessment) has identified that a significant effect is nonetheless likely; or2) an impact at this receptor which, based upon further qualitative receptor information, (see assessment text) does not give rise to a significant effect.
~	Significant effect - impacted dwellings which are either spatially remote from larger defined residential areas, or a small number of dwellings whose impact is not considered to represent the larger defined residential area, and as such are not considered to be part of a community significant effect.
A	Type of effect – adverse effect
S	Type of effect – significant adverse effect
NA	Type of effect – not generally an adverse effect
B	Type of effect – for non-residential receptors further detail about the type of effect is set out in

the text of Volume 5: Appendix SV-001-000

- R Type of receptor - residential
- G Type of receptor:
 - (G1) theatres, large auditoria and concert halls;
 - (G2) sound recording and broadcast studios;
 - (G3) places of meeting for religious worship, courts, cinemas, lecture theatres, museums and small auditoria or halls;
 - (G4) schools, colleges, hospitals, hotels and libraries; or
 - (G5) offices and general commercial premises.
- T Receptor design – typical
- S Receptor design - special
- H Existing environment – high existing ambient noise levels: daytime level more than 75dB, evening-time level more than 65dB or night-time level more than 55dB L_{pAeq} at the façade.
- NI Mitigation effect - identified as likely to qualify for noise insulation under the draft Construction Code of Practice (draft CoCP).
- D,E,N Impact duration (months) – duration of impact during the day (D), evening (E) or night (N).

Table 2: Assessment of construction noise at residential receptors

Assessment location		Impact criteria			Significance criteria								Significant effect	
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade		Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700										
274086	Godington, Bicester	<40/49 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	
274142	Chetwode, Buckingham	65/74 [A]	-	-	Day: Chetwode cutting - cutting - excavation.	A	3	R	T	-	-	-	D 5	-
274201	Newton Purcell, Buckingham	<40/49 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	
274255	Newton Purcell, Buckingham	41/50 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	
274265	Newton Purcell, Buckingham	41/50 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	
274327	Newton Purcell, Buckingham	<40/47 [A]	-	-	Day: haul route movements - on site	NA	2	R	T	-	-	-	-	
274535	Chetwode, Buckingham	45/53 [A]	-	-	Day: haul route movements - on site.	NA	3	R	T	-	-	-	-	
274609	Chetwode, Buckingham	56/63 [A]	-	-	Day: School End overbridge - site clearance.	NA	8	R	T	-	-	-	-	
274745	Chetwode, Buckingham	48/57 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	

Assessment location		Impact criteria					Significance criteria							Significant effect			
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700- 1900	Evening 1900- 2300	Night 2300- 0700													
274787	Godington, Bicester	42/50 [A]	-	-	Day: haul route movements - on site.		NA	1	R	T	-	-	-	-	-		
274854	Godington, Bicester	42/50 [A]	-	-	Day: haul route movements - on site.		NA	2	R	T	-	-	-	-	-		
275094	Unnamed Road, Chetwode	41/51 [A]	-	-	Day: haul route movements - on site.		NA	5	R	T	-	-	-	-	-		
275155	Chetwode, Buckingham	46/55 [A]	-	-	Day: haul route movements - on site.		NA	2	R	T	-	-	-	-	-		
275187	Chetwode, Buckingham	57/63 [A]	-	-	Day: The Green overbridge - construction works - substructure.		NA	1	R	T	-	-	-	-	-		
275245	Newton Purcell, Buckingham	46/55 [A]	-	-	Day: haul route movements - on site.		NA	1	R	T	-	-	-	-	-		
275251	Chetwode, Buckingham	53/66 [A]	-	-	Day: haul route movements - on site.		A	1	R	T	-	-	-	D 1	-	-	-
277651	Chetwode, Buckingham	45/54 [A]	-	-	Day: haul route movements - on site.		NA	1	R	T	-	-	-	-	-	-	-
277682	Barton Hartshorn, Buckingham	43/50 [A]	-	-	Day: haul route movements - on site.		NA	9	R	T	-	-	-	-	-	-	-

Assessment location		Impact criteria					Significance criteria							Significant effect			
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700- 1900	Evening 1900- 2300	Night 2300- 0700													
277726	Barton Hartshorn, Buckingham	43/52 [A]	-	-	Day: haul route movements - on site.		NA	8	R	T	-	-	-	-	-		
277745	Barton Hartshorn, Buckingham	45/53 [A]	-	-	Day: haul route movements - on site.		NA	2	R	T	-	-	-	-	-		
277995	Unnamed Road, Barton Hartshorn	49/57 [A]	-	-	Day: haul route movements - on site.		NA	1	R	T	-	-	-	-	-		
279462	Unnamed Road, Barton Hartshorn	42/49 [A]	-	-	Day: haul route movements - on site.		NA	2	R	T	-	-	-	-	-		
284303	Tudors Close, Calvert	45/52 [A]	-	-	Day: waste transfer siding access for waste recycling group - track work.		NA	21	R	T	-	-	-	-	-		
285186	Sandy Road, Calvert	51/59 [A]	-	-	Day: waste transfer siding access for waste recycling group - track work.		NA	8	R	T	-	-	-	-	-		
285268	Brindles Close, Calvert	44/51 [A]	-	-	Day: haul route movements - to and from road.		NA	21	R	T	-	-	-	-	-		
285464	Brickhill Way, Calvert	52/61 [A]	-	-	Day: waste transfer siding access for waste recycling group - track work.		NA	4	R	T	-	-	-	-	-		

Assessment location		Impact criteria					Significance criteria								Significant effect	
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700- 1900	Evening 1900- 2300	Night 2300- 0700												
z85731	Cotswolds Way, Calvert	54/62 [A]	-	-	Day: waste transfer siding access for waste recycling group - track work.	NA	3	R	T	-	-	-	-	-	-	-
z85737	Cotswolds Way, Calvert	53/61 [B]	-	-	Day: waste transfer siding access for waste recycling group - track work.	NA	14	R	T	-	-	-	-	-	-	-
z85881	Brackley Lane, Calvert	64/73 [A]	-	-	Day: School Hill and Green overbridge - site clearance.	A	3	R	T	-	-	-	-	D 25	-	-
z86395	Charndon, Bicester	42/50 [A]	-	-	Day: waste transfer siding access for waste recycling group - track work.	NA	1	R	T	-	-	-	-	-	-	-
z86439	School Hill, Charndon	46/53 [A]	-	-	Day: haul route movements - to and from road.	NA	14	R	T	-	-	-	-	-	-	-
z86452	Calvert, Buckingham	60/68 [A]	-	-	Day: School Hill and Green overbridge - site clearance.	A	1	R	T	H	-	-	-	D 16	-	-
z86506	Werner Terrace, Calvert	54/63 [B]	-	-	Day: School Hill and Green overbridge - site clearance.	NA	14	R	T	H	-	-	-	-	-	-
z86585	Brackley Lane, Calvert	53/62 [B]	-	-	Day: waste transfer siding access for waste recycling group - track work.	NA	11	R	T	-	-	-	-	-	-	-
z86608	Brackley Lane, Calvert	49/58 [A]	-	-	Day: west retaining walls - culvert cutting - install secant piled walls under School Hill and Green overbridge.	NA	2	R	T	-	-	-	-	-	-	-

Assessment location		Impact criteria					Significance criteria							Significant effect			
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700- 1900	Evening 1900- 2300	Night 2300- 0700													
z86616	Brackley Lane, Calvert	55/65 [A]	-	-	Day: west retaining walls - culvert cutting - install secant piled walls under School Hill and Green overbridge.	NA	1	R	T	-	-	-	-	-	-	-	
z86631	Brackley Lane, Calvert	56/66 [A]	-	-	Day: waste transfer siding access for waste recycling group - track work.	A	2	R	T	-	-	-	D 2	-	-	~	
z86799	Calvert Road, Steeple Claydon	49/56 [A]	-	-	Day: waste transfer siding access for waste recycling group - track work.	NA	3	R	T	-	-	-	-	-	-	-	
z86928	Sandy Road, Calvert	55/63 [A]	-	-	Day: waste transfer siding access for waste recycling group - track work.	NA	1	R	T	-	-	-	-	-	-	-	
z86954	Brickhill Way, Calvert	54/62 [A]	-	-	Day: waste transfer siding access for waste recycling group - track work.	NA	1	R	T	-	-	-	-	-	-	-	
z87292	Church Street, Twyford	42/51 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	-	-	
z87430	Mill Lane, Twyford	46/56 [A]	-	-	Day: haul route movements - on site.	NA	2	R	T	-	-	-	-	-	-	-	
z88053	Main Street, Twyford	<40/45 [A]	-	-	Day: Perry Hill Road overbridge - new southern embankment and link to West Street.	NA	4	R	T	-	-	-	-	-	-	-	
z88290	Mill Lane, Twyford	42/51 [A]	-	-	Day: haul route movements - on site.	NA	14	R	T	-	-	-	-	-	-	-	

Assessment location		Impact criteria					Significance criteria							Significant effect		
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700- 1900	Evening 1900- 2300	Night 2300- 0700												
z88381	Grange Close, Twyford	<40/49 [A]	-	-	Day: haul route movements - on site.		NA	8	R	T	-	-	-	-	-	
z88401	Grange Close, Twyford	42/54 [A]	-	-	Day: haul route movements - on site.		NA	4	R	T	-	-	-	-	-	
z88421	Church Street, Twyford	49/56 [A]	-	-	Day: haul route movements - on site.		NA	1	R	T	-	-	-	-	-	
z88448	Church Street, Twyford	48/57 [A]	-	-	Day: haul route movements - on site.		NA	2	R	T	-	-	-	-	-	
z88469	Main Street, Twyford	<40/48 [A]	-	-	Day: haul route movements - on site.		NA	4	R	T	-	-	-	-	-	
z88518	Church Street, Twyford	<40/49 [A]	-	-	Day: Twyford west viaduct - site set up.		NA	8	R	T	-	-	-	-	-	
z88528	Church Street, Twyford	45/52 [A]	-	-	Day: haul route movements - on site.		NA	2	R	T	-	-	-	-	-	
z88619	Bicester Road, Twyford	<40/49 [A]	-	-	Day: haul route movements - on site.		NA	30	R	T	-	-	-	-	-	
z88684	Preston Bissett, Buckingham	48/55 [A]	-	-	Day: haul route movements - on site.		NA	2	R	T	-	-	-	-	-	
z88715	Preston Bissett,	<40/45	-	-	Day: haul route movements - on site.		NA	3	R	T	-	-	-	-	-	

Assessment location		Impact criteria					Significance criteria							Significant effect	
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect
	Buckingham	[A]													
z88944	Twyford, Buckingham	46/55 [A]	-	-	Day: Perry Hill Road overbridge - construction works - substructure.	NA	1	R	T	-	-	-	-	-	-
z88993	Twyford Road, Twyford	41/52 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-	-
z89009	Twyford Road, Twyford	43/52 [A]	-	-	Day: calvert infrastructure maintenance depot and access road - construct temporary access road on line of new permanent road to depot.	NA	1	R	T	-	-	-	-	-	-
z89065	Preston Bissett, Buckingham	<40/50 [A]	-	-	Day: haul route movements - on site.	NA	2	R	T	-	-	-	-	-	-
z89225	Steeple Claydon, Buckingham	65/71 [A]	-	-	Day: haul route movements - to and from road.	A	1	R	T	-	-	-	D 26	-	-
z89279	West Street, Steeple Claydon	<40/46 [A]	-	-	Day: haul route movements - to and from road.	NA	1	R	T	-	-	-	-	-	-
z89311	Calvert Road, Steeple Claydon	46/55 [A]	-	-	Day: waste transfer siding access for waste recycling group - track work.	NA	5	R	T	-	-	-	-	-	-
z89346	Steeple Claydon, Buckingham	53/62 [A]	-	-	Day: Addison Road overbridge - construct south abutment.	NA	2	R	T	-	-	-	-	-	-

Assessment location		Impact criteria			Significance criteria								Significant effect	
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade		Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300											
z89621	West Street, Steeple Claydon	48/55 [A]	-	-	Day: haul route movements - to and from road.	NA	1	R	T	-	-	-	-	
z89659	West Street, Steeple Claydon	46/52 [A]	-	-	Day: calvert infrastructure maintenance depot and access road - construct temporary access road on line of new permanent road to depot.	NA	1	R	T	-	-	-	-	
700423	Unnamed Road, Steeple Claydon	44/50 [A]	-	-	Day: haul route movements - to and from road.	NA	1	R	T	-	-	-	-	
700424	Queen Catherine Road, Steeple Claydon	<40/44 [A]	-	-	Day: calvert infrastructure maintenance depot and access road - earthworks for temporary railhead and depot.	NA	3	R	T	-	-	-	-	
700425	Queen Catherine Road, Steeple Claydon	44/49 [A]	-	-	Day: haul route movements - to and from road.	NA	1	R	T	-	-	-	-	
700426	Queen Catherine Road, Steeple Claydon	43/49 [A]	-	-	Day: haul route movements - to and from road.	NA	2	R	T	H	-	-	-	
700427	Queen Catherine Road, Steeple Claydon	46/52 [A]	-	-	Day: haul route movements - to and from road.	NA	1	R	T	-	-	-	-	
700428	Ashgrove, Steeple Claydon	<40/44 [A]	-	-	Day: east west rail realignment - track work.	NA	3	R	T	-	-	-	-	

Assessment location		Impact criteria			Significance criteria								Significant effect	
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade		Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700- 1900	Evening 1900- 2300		Night 2300- 0700									
700429	West Street, Steeple Claydon	48/56 [A]	-	-	Day: haul route movements - to and from road.	NA	1	R	T	-	-	-	-	
700430	Portway Road, Twyford	<40/49 [A]	-	-	Day: haul route movements - on site.	NA	2	R	T	-	-	-	-	
700431	Chetwode, Buckingham	40/50 [A]	-	-	Day: haul route movements - on site.	NA	2	R	T	-	-	-	-	

Table 3: Assessment of construction noise at non-residential receptors

Assessment location		Impact criteria			Significance criteria								Significant effect		
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700- 1900	Evening 1900- 2300	Night 2300- 0700											
274854	Godington, Bicester	42/50	-	-	Day: haul route movements - on site.	B	1	G ₃	T	-	-	-	-	-	
275094	Unnamed Road, Chetwode	41/51	-	-	Day: haul route movements - on site.	B	1	G ₃	T	-	-	-	-	-	
277726	Barton Hartshorn, Buckingham	43/52	-	-	Day: haul route movements - on site.	B	1	G ₅	T	-	-	-	-	-	
279462	Unnamed Road, Barton Hartshorn	42/49	-	-	Day: haul route movements - on site.	B	1	G ₃	T	-	-	-	-	-	
284303	Tudors Close, Calvert	45/52	-	-	Day: waste transfer siding access for waste recycling group - track work.	B	1	G ₅	T	-	-	-	-	-	
287292	Church Street, Twyford	42/51	-	-	Day: haul route movements - on site.	B	1	G ₄	T	-	-	-	-	-	
288099	Portway Road, Twyford	<40/44	-	-	Day: haul route movements - on site.	B	2	G ₃	T	-	-	-	-	-	
288099	Portway Road, Twyford	<40/44	-	-	Day: haul route movements - on site.	B	2	G ₅	T	-	-	-	-	-	
288401	Grange Close,	42/54	-	-	Day: haul route movements - on site.	B	1	G ₅	T	-	-	-	-	-	

Assessment location		Impact criteria			Significance criteria								Significant effect	
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade		Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300											
	Twyford													
288421	Church Street, Twyford	49/56	-	-	Day: haul route movements - on site.	NA	1	G ₃	T	-	-	-	-	CSV13-No1
288528	Church Street, Twyford	45/52	-	-	Day: haul route movements - on site.	B	1	G ₅	T	-	-	-	-	
288993	Twyford Road, Twyford	41/52	-	-	Day: haul route movements - on site.	B	3	G ₅	T	-	-	-	-	
289024	Portway Road, Twyford	43/50	-	-	Day: Perry Hill Road overbridge - construction works - substructure.	B	2	G ₅	T	-	-	-	-	
289606	West Street, Steeple Claydon	49/55	-	-	Day: haul route movements - to and from road.	B	1	G ₃	T	-	-	-	-	
549412	West Street, Steeple Claydon	44/52	-	-	Day: haul route movements - to and from road.	B	1	G ₃	T	-	-	-	-	
549412	West Street, Steeple Claydon	44/52	-	-	Day: haul route movements - to and from road.	B	3	G ₅	T	-	-	-	-	
710607	Unnamed Road, Godington	<40/46	-	-	Day: haul route movements - on site.	B	1	G ₃	T	-	-	-	-	
710608	Unnamed Road, Chetwode	41/47	-	-	Day: haul route movements - on site.	B	1	G ₃	T	-	-	-	-	

Airborne sound: indirect effects

4.3.8 Construction road traffic associated with the construction phases of the Proposed Scheme will generate airborne noise. The change in traffic noise level at a reference distance of 10m from the edge of the nearside carriageway resulting from the presence of construction traffic for a given road has been predicted, based upon traffic information for the Proposed Scheme. The results for the roads where potentially significant effects could arise are presented in Table 4.

4.3.9 Explanation of the information within Table 4 is provided in Volume 5: Appendix SV-001-000, with the following additional notes:

 Where the significant effect column is highlighted in dark red, then a significant effect is identified on nearby communities or individual receptors

Change values

 Yellow denotes a minor impact – a change of between 3 and 5dB or between 1 and 3dB where a high existing sound level is identified

 Orange denotes a moderate impact – a change of between 5 and 10dB or between 3 and 5dB where a high existing sound level is identified

 Red denotes a major impact – a change of more than 10dB or more than 5dB where a high existing sound level is identified

Table 4: Assessment of construction traffic noise levels

Road name	Link	Future baseline sound level (dB)	Future baseline sound level + construction traffic (dB)	Change (dB)	Significant effect
		Daytime $L_{pAeq,16hr}$ 0700-23:00 free-field	Daytime $L_{pAeq,16hr}$ 0700-2300 free-field		
Perry Hill (south of School Hill)	Calvert	66.3	70.9	+4.6	CSV13-Co1
School Hill (west of Perry Hill)	Calvert	61.9	64.9	+3.0	CSV13-Co2
Perry Hill (north of School Hill)	Calvert	61.2	70.2	+9.0	CSV13-No2
School End	Chetwode	47.8	52.9	+5.1	CSV13-Co3

4.4 Assessment of significant effects

Residential receptors: direct effects - individual dwellings

4.4.1 The mitigation measures will reduce noise inside all dwellings such that it does not reach a level where it will significantly affect¹ residents.

Residential receptors: direct effects –communities

4.4.2 With regard to noise outside dwellings, the assessment of temporary effects takes account of construction noise relative to existing sound levels.

4.4.3 In locations with lower existing sound levels², construction noise effects are likely to be caused by changes to noise levels outside dwellings. These may be considered by the local community as an effect on the acoustic character of the area and hence be perceived as a change in the quality of life.

4.4.4 In this area, the mitigation measures reduce the effects of outdoor construction noise on the acoustic character around the local residential communities such that the adverse effects identified are considered to be not significant.

Residential receptors: indirect effects

4.4.5 Construction traffic is likely to cause adverse noise effects on residential receptors along the following local roads:

- Perry Hill (south of School Hill) where it passes to the west of Calvert (CSV13 Co1) - approximately 10 dwellings located close to the road are forecast to experience an increase in outdoor noise levels of around 5dB during the peak months (further information on traffic flows is provided in Section 12: Traffic and Transport);
- School Hill (west of Perry Hill) to the west of Calvert (CSV13 Co2) - approximately 15 dwellings located immediately adjacent to the lane are forecast to experience an increase in outdoor noise levels of around 3dB during the peak months (further information on traffic flows is provided in Section 12: Traffic and Transport); and
- School End where it passes to the north of Chetwode (CSV13 Co3) - approximately 10 dwellings located immediately adjacent to the lane are forecast to experience an increase in outdoor noise levels of around 5dB during the peak months (further information on traffic flows is provided in Section 12: Traffic and Transport).

4.4.6 These adverse effects will be a change in the acoustic character of the area such that there is a perceived change in the quality of life and are considered significant when assessed on a community basis taking account of the local context¹.

² Further information is provided in Volume 5: Appendix SV-001-000.

- 4.4.7 The construction railhead at Calvert will be used for the movement of excavated materials, construction materials deliveries and as an access to the Proposed Scheme track route, for ballast and track laying. Movement of trains to and from the sidings and railheads on the classic rail network will utilise available train paths and will comprise a very small percentage of total train movements on the classic rail network. It is therefore unlikely that train movements associated with construction rail heads will result in a significant change in rail noise levels at residential receptors situated close to the classic rail network.

Non-residential receptors: direct effects

- 4.4.8 A significant construction noise effect has been identified on a worst case basis on the Church of the Assumption of the Blessed Virgin Mary, Church Street, Twyford (CSV13-No1). Significant noise effects have been identified during the daytime with noise levels rising at times to around 55dB³ over a period of approximately one month in 2018 during the construction of the Twyford west viaduct and then for a further two months in 2019 due to vehicle movements on haul roads within the construction boundary.

Non-residential receptors: indirect effects

- 4.4.9 On a worst case basis, construction traffic is likely to cause significant indirect noise effects at non-residential receptors along Perry Hill (north of School Hill) where it passes Grebe Lake affecting the use of the buildings at Great Moor Sailing Club (CSV13-No2). This is associated with a forecast increase in way side noise levels of around 9dB in the peak months (further information on the traffic flows is provided in Section 12: Traffic and Transport).

- 4.4.10 The construction railhead at Calvert will be used for the movement of excavated materials, construction materials deliveries and as an access to the Proposed Scheme track route, for ballast and track laying. Movement of trains to and from the sidings and railheads on the classic rail network will utilise available train paths and will comprise a very small percentage of total train movements on the classic rail network. It is therefore unlikely that train movements associated with construction rail heads will result in a significant change in rail noise levels at non-residential receptors situated close to the classic rail network.

Cumulative effects from the Proposed Scheme and other committed development

- 4.4.11 This assessment has considered the potential cumulative construction noise effects of the Proposed Scheme and other committed developments⁴. In this area, there are no developments that will be built at the same time as the Proposed Scheme and accordingly, construction noise or vibration from the Proposed Scheme is unlikely to result in any significant cumulative noise effect.

³ L_{pAeq,0800-1800} measured at the facade

⁴ Refer to Volume 5: Appendix CT-004-000